REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated September 26, 2002.

Claims 3-19 are under consideration in this application. Claims 1-2 are being cancelled without prejudice or disclaimer. Claims 3-10 are being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. Claims 11-19 are being added to recited other embodiments described in the specification. Figs. 9-10 and 13 are being corrected as requested by the Examiner. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Formality Objection and Rejection

The Information Disclosure Statement on file was objected to for not including JP App. No. 7-259796 (JP Pub. No. 09-098972). An IDS listing the JP App. is filed herewith.

Figs. 9-10 and 13 are objected because they were either not labeled correctly or lacked reference signs. Claims 1-10 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, claims 1, 4 and 10 were considered too vague and could not easily be understood; and claim 2 lacked antecedent basis. As indicated, the drawings and claims have been amended as required to overcome the objections and rejections.

Accordingly, the withdrawal of the outstanding informality objections and rejections is in order, and is therefore respectfully solicited.

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Prior Art Rejections

Claims 1-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 09019408 to Maki et al. (hereinafter "Maki JP") or by U.S. Pat. No. 5,803,909 to Maki et al. (hereinafter "Maki US"). In addition, claim 10 was rejected as being anticipated by U.S. Pat. No. 5,448,992 to Kuperschmidt (hereinafter "Kuperschmidt"). Prior art references Yamashita et al. (6,240,309), Kawaguchi et al. (5,419,320) and Chance (6,397,099) have been cited as being pertinent to the present application These rejections have been carefully considered, but are most respectfully traversed.

The optical measurement device of the invention, as now recited in claim 4, comprises: illuminating means for sending out a light to illuminating the subject; detecting means for detecting at least one reflected or scattered light from the illuminated subject; determining means for determining at least one measurement amount or measurement amount variation of the measurement object substance at a measurement position according to a detection value detected at a detection position by the detecting means; displaying means for displaying on a first image screen a mapping image formed by connecting points with an equal measurement amount or measurement amount variation as determined by the determining means; and designating means for designating at least one position on the mapping image or in the measurement region of the subject so as to visually output in a second image or audibly output a numerical value of the measurement amount or the measurement amount variation of the measurement object substance at the position designated.

The optical measurement device, as now recited in claim 10, further comprises: a sensor for sensing said at least one measurement position in the measurement region of the subject as designated by the designating means, said sensor being made from a piezoelectric element and placed under a contact or non-contact condition to the subject; and optical fibers passing through the sensor to the subject for transmitting the light from the illuminating means onto the illumination position within the measurement region and for outputting a detection value detected by the detecting means at the detection position (Fig. 3).

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First of all, Applicants respectfully contend that none of the cited prior art references teaches or suggests an optical measurement device comprising "designating means, such as a pointing device, for designating at least one position on the mapping image s or in the measurement region of the subject so as to visually output in a second image or audibly output a numerical value of the measurement amount or the measurement amount variation of the measurement object substance at the position designated" as recited in claim 4 of the invention.

In contrast, Miki JP, Miki US, Chance (Figs. 4-6), Yamashita (Figs. 12-14 show the bar of a position with respect to a scale but not the position's numerical values), and Kawaguchi (Figs. 7 & 9), like the references cited in the present application, show a mapping image formed by connecting points with an equal measurement amount or measurement amount variation. No position on the mapping image is designated for outputting its numerical data visually or audibly in these references. At most, Yamashita (Figs. 12-14) shows the bar of a position with respect to a scale but not the position's numerical values. As to Kuperschmidt, it measures a light passing via a finger or a ear lobule as a whole without discriminating different positions thereon such that it does not even map measurements with positions at all.

Secondly, none of the cited prior art references teaches or suggests an optical measurement device comprising "a sensor for sensing said at least one measurement position in the measurement region of the subject as designated by the designating means, said sensor being made from a piezoelectric element and placed under a contact or non-contact condition to the subject" as recited in claim 10 of the invention.

Contrary to the Examiner's allegation that Kuperschmidt shows all features of claim 10 including optical fibers passing via a sensor 28 made from a piezoelectric element, nowhere in Kuperschmidt does it teach, suggest or even imply combining the only piezoelectric element, i.e., PZT 26, with any fiber-optical link 100 or the like. The Examiner

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failed to provide the specific citations in Kuperschmidt to allow accountability. In addition, Kuperschmidt does not perform map measurements with different positions on the subject at all. Further, Kuperschmidt does not teach a sensor placed next to the subject for sensing the measurement position in the measurement region of the subject as designated by the designating means, such as a pointer 3-4. Rather, Kuperschmidt converts all the passing-via light into an electrical signal (Abstract, lines 12-15 and 18-20) without discriminatingly sensing only the reflected or scattered light from the designated position.

As such, none of the cited references, or their combinations, teaches or discloses each and every feature of the present invention as recited in independent claim 4. The present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Applicant respectfully caution that any potential reliance by the Examiner on "common knowledge and common sense" to teach the combination of the teachings of the cited prior art with the general pop-up displaying information technology will not fulfill the agency's obligation to cite references to support such a combination. Instead, the Examiner must provide the specific teaching of such a combination applied in the exact hardware environment on the record to allow accountability.

> *To establish a prima facie case of obviousness, the Board must, inter alia, show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." Kotzab, 217 F.3d at 1370, 55 USPQ2d at 1317. .... Recently, in In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), we held that the Board's reliance on "common knowledge and common sense" did not fulfill the agency's obligation to cite references to support its conclusions. Id. at 1344, 61*

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USPQ2d at 1434. Instead, the Board must document its reasoning on the record to allow accountability. Id. at 1345, 61 USPQ2d at 1435.

See In re Thrift, 298 F.3d 1357.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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Marked-up Version of Amended Claims

3. An optical measurement device according to claim [2]4, [characterized in that as a display of the second display portion a moving picture is] wherein a plurality of measurement amounts or measurement amount variations of the measurement object substance at the position designated are taken within a time period and displayed.

4. An optical measurement device which optically measures a measurement object substance within a measurement region of a subject, [characterized in that the optical measurement device] comprising:

illuminating means for sending out a light to illuminating the subject;

detecting means for detecting at least one reflected or scattered light from the illuminated subject;

determining means for determining[es a] at least one measurement amount or measurement amount variation of the measurement object substance at a measurement position according to a detection value detected at a detection [portion] position by the detecting means [of a light illuminated from an illumination position within the measurement region,];

displaying[s] means for displaying on a first image screen a mapping [shaped] image formed by connecting points [(positions) having] with an equal measurement amount or measurement amount variation as determined by the determining means [by making use of the measured amount,]; and

designating means for designating[es any] at least one position on the mapping image or in the measurement region of the subject so as to visually output in a second image or audibly output [and displays on a second image screen] a numerical value of the measurement amount or the measurement amount variation of the measurement object substance at the position designated.

5. An optical measurement device according to claim 4, [characterized in that there are a plurality of illumination positions, a] wherein the light having a plurality of wavelengths [is illuminated on the respective illumination positions, from one detection position a light component including signal] and said reflected or

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scattered light is detected by the detected means then separated into light components of corresponding [number] plurality of wavelengths by the determining means[at the concerned illumination positions, a reference signal is provided for each of the light components and the measurement amount is determined after separating light components each having respective wavelengths].

6. An optical measurement device according to claim 4, [characterized in that] wherein the measurement amount or the measurement amount variation of the measurement object substance at the position designated is displayed in the first image screen [and the second image screen are constituted by a single display screen].

7. An optical measurement device according to claim 4, [characterized in that] wherein the measurement amount or the measurement amount variation of the measurement object substance at the position designated is displayed in [the first and the] a second image screen [are constituted as separate display screens].

8. An optical measurement device according to claim 4, [characterized in that] wherein a pair of horizontal and vertical lines passing through the designated position [in horizontal and vertical directions] are displayed on the first image screen [while displacing the same in response to a change of the position designation].

9. An optical measurement device according to claim 8, [characterized in that a] scales for reading horizontal and vertical positions [of] on the horizontal and vertical lines [in horizontal and vertical directions] are displayed on the first image screen.

10. An optical measurement device [which optically measures a measurement object substance within a measurement region of a subject, haracterized in that optical

fibers are passed through] according to claim 4, further comprising:

a sensor for sensing said at least one measurement position in the measurement region of the subject as designated by the designating means, said sensor being made from a piezoelectric element [which is] and placed under a contact or non-contact condition to the subject[, a measurement position is set on the sensor,]; and

optical fibers passing through the sensor to the subject for transmitting the [a] light [is illuminated] from the illuminating means [the optical fiber] onto [an] the illumination position within the measurement region[,] and for outputting a detection value detected by the detecting means at [a] the detection position [is outputted via the optical fiber and measurement amount or measurement amount variation of the measurement object substance at a measurement position is determined].

Marked-up Copy of Specification

SPECIFICATION

TITLE OF THE INVENTION

Optical Measurement Device

FIELD OF THE INVENTION

The present invention relates to an optical measurement device and, more specifically, relates to an optical measurement device which is suitable for obtaining metabolic information in vivo.

BACKGROUND ART

As a somatometry using light, an optical topography which is used for measuring brain function has been known as disclosed, for example, in Japanese Patent ~~Application~~ Publication No. ~~Hei 7-259796~~ JP-A-9-98912 and JP-A-5-115485. In such optical topography, light is illuminated on a living body representing a measurement object (a subject), and transmitted and scattered light from the tissue in vivo is collected and detected at a point remote from the illumination point by a few mm to a few cm. An optical fiber is generally used as a light guiding means when illuminating light onto a living body and detecting light from the living body. From the measured intensity of the transmitted and scattered light from the tissue in vivo a density of light absorption substance in vivo can be determined.

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Marked-up Copy of Abstract

ABSTRACT

Optical measurement that is optimum for improving spatial resolution is accomplished by making it possible to estimate a physical quantity of an object substance to be measured at any point on a subject. When any position to be evaluated, in an image shown in a window (1-1), is pointed and selected using a mouse pointer (1-4), the value of the concentration or its change of the object substance at the point is displayed in the display area (1-7) of a window (1-3). The drawing represents an example in which one position is specified and there are two object substances to be measured. The value of the concentration or its change of each object substance to be measured is separately displayed.

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